

## **VIRGINIA CAVE BOARD MEETING MINUTES**

**Saturday, June 28, 2014**

**Madison Room**

**Natural Bridge Park and Historic Hotel**

**15 Appledore Lane**

**Natural Bridge, VA 24578**

**2:00 PM**

### **Virginia Cave Board (VCB) Members Present**

Dr. Daniel Doctor

Dr. John Haynes

Mr. Rick Lambert

Mr. Steve Lindeman

Ms. Marian McConnell

Ms. Janet Tinkham

Ms. Meredith Weberg

### **Virginia Cave Board Members Absent**

Ms. Michele Baird

Ms. Ruth Blankenship

Mr. Robert Denton, Jr.

Mr. John Graves

### **Department of Conservation and Recreation (DCR) Staff Present**

Mr. Larry Smith

Mr. Tom Smith

Mr. Wil Orndorff

### **Guests**

Mr. Tom Lera

Mr. Joey Fagan

Chairman Meredith Weberg called the meeting to order at 2:08 p.m.

### **Introductions**

Introductions were made by all VCB members, DCR staff and guests present.

### **Announcements**

Ms. Weberg expressed thanks on behalf of the entire Cave Board to:

- Mr. Tom Lera for updating the *Introduction to the Virginia Cave Board* and providing folders to each board member containing copies of the revised document; a paper Mr. Lera authored entitled *The Virginia Cave Board: The First Fifty Years* that focuses on the history of the Virginia Cave Protection Act, the Virginia Cave Board, and the activities

taken to protect caves and karst resources in Virginia; and a list of past and present VCB members and the years that they served.

- Ms. Michele Baird for providing the 2014 Lesson Plan that was added to the Virginia Cave Week website (<http://vacaveweek.com/lessons.htm>).
- Ms. Marian McConnell for loaning her ballad “We Live On Hollowed Ground” for the Virginia Cave Week theme.
- Front Royal Grotto and volunteers for organizing the Cave and Karst Fest at Skyline Caverns during Virginia Cave Week.
- Wil Orndorff, other DCR staff and volunteers for conducting Walking Tours of Mill Creek Springs Natural Area Preserve during Virginia Cave Week.

Ms. Ruth Wilson Blankenship resigned from Cave Board.

There are vacant slots on the board as of June 30, 2014, and will be discussed further on in meeting.

### **Approval of Past Meeting Minutes**

Minutes from the February 22, 2014, meeting had been shared with the Board. After verifying that Ms. Mary Sue Socky was present as a guest and added to minutes, Mr. Steve Lindeman moved to accept the minutes and Dr. Dan Doctor seconded the motion. The minutes were approved by the Board.

### **Treasurer’s Report**

Mr. Larry Smith reported that \$1,412 is the current balance in the Virginia Cave Board account. Discussion took place around resources for additional funding to produce future copies of the *Virginia Cave Owners’ Newsletter* and purchase Virginia Cave and Karst Trail signs. Suggestion was made to check the Cave Conservancy of the Virginias website (<http://caveconservancyofvirginia.org/>) for updated grant application guidelines. Ms. Weberg expressed a willingness to assist with applying for grant funding for Virginia Cave and Karst Trail signs—she is getting a quote from a friend who has inherited a sign business. Mr. Tom Smith mentioned the Virginia DCR State Parks Sign Shop option as a possibility of free or low cost. The Board discussed possible mounting options and the need for securing permission for posting signs depending on where they will be placed. This will be discussed in more detail later. Mr. Lindeman suggested checking with the Virginia Department of Transportation before printing signs to assure compliance with state regulations.

### **Karst Program Update**

Mr. Orndorff provided a hard copy and overview of the following report, which is inserted below in its entirety, unedited.

DCR Karst Protection Coordinator Wil Orndorff was coauthor on three abstracts at the 2014 Southeastern Regional Meeting of the Geological Society of America, held in Blacksburg in early April. Orndorff was sole author on “Temperature, conductivity, turbidity and level responses

to precipitation of phreatic waters exposed in cave fissures: implications for deep groundwater flow in the Shenandoah Valley karst”; was a co-author with cave board member and USGS scientist Dan Doctor, DEQ hydrologist Joel Maynard, VA-DMME geologist Matt Heller, and USGS scientist Jerry Casile on the paper “Geologic factors influencing shallow and deep karst formation in the Shenandoah Valley, Virginia” ; and a co-author with Dr. Madeline Scheiber of Virginia Tech, Dan Doctor, Sarah Eagle, and Benjamin Schwartz of Texas State on “Using geochemical data from speleothem drips to infer hydrologic controls on recharge in James Cave, Virginia.” In addition, Doctor, Orndorff, Maynard, Heller, and Casile led a two day field trip following the meeting investigating the karst geomorphology and hydrology of the North River headwaters area near Harrisonburg, attend by a dozen geologists from around the nation. A published field guide is available upon request. A copy of the first listed abstract is included at the end of this report.

As part of Virginia Cave Week, DCR staff led tours on April 22 and 23 to Mill Creek Springs Natural Area Preserve in Montgomery County. Seventy-four citizens participated in the tours, which featured a couple of dozen native wildflower species adapted for calcium rich limestone soils, as well as spectacular cave spring resurgence. Participants learned about local underground water flow, and the important connection between surface and subsurface waters in karst.

DCR Natural Heritage karst staff and DCR educator Carol Zokaite hosted the *Stygobromus* working group Virginia from May 11 through May 15. The *Stygobromus* working group consists of several cave biologists from the National Speleological Society Biology Section who have interest and expertise in cave-adapted amphipods, most of which are in the genus *Stygobromus* and all of which were described formally by long time Virginia Cave Board member Dr. John Holsinger. Amphipods are invertebrates, and belong to the same taxonomic order (Decapoda) as crabs and crawfish. Twenty cave-adapted *Stygobromus* species are known from Virginia, sixteen of which occur only in Virginia. Undescribed species still remain. The working group’s goal is to develop genetic fingerprints for all species in the genus, both to facilitate identification when taxonomic expertise is lacking, and to enable analyzing the phylogenetic relationship within the genus, which reveal the degree of interrelatedness between species. To this end, specimens of each species are being collect from its type locality. Seven type localities were visited in Virginia, of which five yielded specimens. In addition, specimens were collected from each of the three type localities visited in West Virginia. This project is being supported by a grant from the Cave Conservancy of the Virginias. The *Stygobromus* Working Group will be returning to Virginia in the fall to collect specimens from type localities in the Shenandoah Valley, as well as adjacent portions of Maryland and West Virginia.

During one of the amphipod collecting trips to a cave in the James River basin, a cluster of approximately 200 bats were observed. Natural Heritage bat biologist Chris Hobson returned with Karst Protection Coordinator Wil Orndorff to the site. Seven bats were removed from the cluster for examination. Five turned out to be federally endangered Indiana bats, while the remaining two were little brown bats. The little brown bats’ wings were in noticeably bad condition – numerous scars and tears – in comparison with those of the Indiana bats, which

appeared flawless. The damage to the little brown bats is presumably from White Nose Syndrome, the fungal disease that has killed over 90% of Virginia's little brown bats. Indiana bats, though impacted from the disease, appear to be faring better based on hibernacula counts, and the difference in wing condition supports this. The colony represents a new county record for the Indiana bat in Virginia, and may be a mixed, summer bachelor colony. More investigation is planned.

DCR Karst staff assisted Texas State professor Benjamin Schwartz in installation of monitoring equipment in the Omega Cave System in Wise County, Virginia.

Orndorff and DCR Karst Protection Assistant Ellen Koertge submitted two abstracts for the upcoming 2014 National Speleological Society (NSS) Convention in Huntsville, Alabama in July. The abstract were entitled "Karst hydrology of the Cedars Significant Karst Area, Revisited: Lee County, Virginia" and "Updating records of invertebrate cave fauna adjacent to roadway corridors in Virginia". The abstracts are included in full at the end of this report. In addition, Dr. John Holsinger will be featured as a "luminary" speaker at the NSS convention on July 16. (Abstracts included as an Attachment to the minutes.)

DCR is working with Bill Balfour to perform a comprehensive karst inventory of the Cedars Natural Area Preserve and adjacent lands in Lee County. Deliverables for the project include cave maps, GPS locations of caves and other karst features, subterranean flow paths, and a prioritized list of addition properties for which protection is valuable due to presence of sensitive or rare karst features.

DCR is working with the US Fish and Wildlife Service to perform status updates for seventeen globally rare beetle species known from a total of thirty-three locations, all in Virginia. Information from this study will be used by the Fish and Wildlife Service to help assess whether Endangered Species Act protections would be justified for these species.

Summer mist netting is under way in cooperation with Rick Reynolds of the Department of Game and Inland Fisheries, as well as Mark Ford of Virginia Tech and Karen Powers of Radford University in an attempt to locate and monitor maternity colonies of the little brown bat. To date, the vast majority of captures have been of Big brown bats and Red bats. Little brown bats appear to be all but absent on the landscape.

### **Land Conservation Update**

Mr. Lindeman recently received a copy of the U.S. Fish and Wildlife Service formal five-year review on the status of the Lee County cave isopod. In this review, author Shane Hanlon reports that the population of the Lee County cave isopod has recovered sufficiently to "down list" the species from endangered to threatened, which is good news. Smiths Milk Cave and Thompson Cedar Cave, both land acquisition targets for the Nature Conservancy, are also known to support populations of the Lee County cave isopod. Acquisition of tracts containing these caves will further enhance the argument for downlisting of the species.

DCR Division of Natural Heritage Program staff will be filling a new stewardship staff position in southwest Virginia. The position will be based in Natural Tunnel State Park and will have Lee County and The Cedars Natural Area Preserve in its service area. Mr. Lindeman was on the interview panel that selected a top candidate from an excellent pool of applicants. DCR hopes to have the position filled by the end of summer.

Mr. Larry Smith is working to coordinate a meeting with manager of property adjacent to Ogden's Natural Area Preserve property to explore possible expansion of preserve.

### **Updates on Board Appointments and Vacancies**

Ms. Ruth Blankenship resigned from the Virginia Cave Board.

Mr. Larry Smith report the terms of Meredith Weberg, Steve Lindeman and Janet Tinkham will be ending in June 2014, creating three vacancies on the board. Mr. David Ek, who was present at the February 22 VCB meeting, had expressed interest in becoming a board member and his credentials were discussed. Ms. Weberg mentioned Mr. Joey Fagan's interest in serving and he confirmed that he is. Ms. Weberg questioned whether Mr. Dave Socky or Ms. Karen Kastning might be interested in serving again. At present Mr. Ek, Mr. Lindeman, and Ms. Janet Tinkham have submitted applications for appointment to the Board that are pending. Mr. Larry Smith said it is good to have a healthy pool of qualified candidates who are identified as options.

### **Old Business**

#### ***Virginia Cave Owners' Newsletter***

Ms. Weberg has no material at present. September 30 is the deadline for submissions for the next issue. Submissions were suggested on the following topics:

- Mr. Lindeman suggested an issue on recovery of the Lee County Isopod with input from Mr. Orndorff and Mr. Shane Hanlon of the US Fish & Wildlife Service. Mr. Lindeman will contact him.
- Mr. Orndorff suggested a write up on the Appalachian Cave Conservancy (ACC), recommending Richard Kretz as a contact and he will provide an email contact for him.
- Gap Cave at Cumberland Gap National Historic Park (Mr. Lindeman will ask for an article)
- Civil War connections to caves
- Short article on Virginia Cave Week projects

Mr. Larry Smith mentioned receiving some replies from the last newsletter mailing asking for newsletter to be emailed, but at present the decision was made to continue mailing. About 100 cave owners have asked that they receive their newsletters via email. Mr. Larry Smith will check on the CCV grant application guidelines for funding future *Virginia Cave Owners' Newsletters*.

### **Mid Appalachian Region (MAR) Meeting of the National Speleological Society in May—VCB Presence**

Ms. Weberg was not able to attend MAR as previously planned. Mr. Rick Lambert attended and spoke about VCB and commented that “they seemed to wonder why VCB was there,” but he represented VCB well.

### **Virginia Cave Week**

Ms. Tinkham and Ms. Weberg participated in the Cave and Karst Fest held at Skyline Caverns and shared details of the event. Mr. Orndorff also shared details of the walking tours of Mill Creek Springs Natural Area Preserve during Virginia Cave Week. Dates for next year’s Virginia Cave Week will be April 19–25, 2015. Board members agreed to begin generating ideas for a theme for Cave Week 2015.

### **New Business**

#### **Virginia Cave Board Presence on the World Wide Web**

The following are details from the productive discussion surrounding VCB new FB page and the VCB website

- VCB now has a Facebook page. Thank you to Ms. Weberg for its creation. It was suggested that a FB policy be developed. Ms. McConnell, Mr. Larry Smith, and Mr. Orndorff will be made administrators in addition to Ms. Weberg.
- Updates are going to be made to the website pages.
- The Virginia Cave and Karst Trail website is live and work will continue on developing its content.
- A Virginia Cave Week website link needs to be added to VCB site.
- Create an archive of past Virginia Cave Week events for the website.
- Mr. Orndorff suggested a write-up of information for commercial cave guides summarizing questions that were answered today during the special tour of Natural Bridge Cave by staff.

#### **Ideas From Tom Lera: Brochure with 10 Questions; Bibliography on website with links, PPTs, and papers; Cave Owners’ Survival Guide**

Further discussion of updating and development of the VCB website took place fueled by the suggestions of Tom Lera noted above:

- Dr. Doctor offered to work on compiling the 10 most frequently asked questions
- Dr. John Haynes offered to work on organizing material for the website by creating PDFs of information we want to keep/add and by removing outdated material.
- We unanimously agreed to get rid of the front page picture of the dead bat and replace with a more “positive” cave-related picture.
- Mr. Larry Smith and Ms. Julie Buchanan of DCR will look at cleaning up and creating a less cluttered front page and adding the frequently answered questions section.
- Mr. Lindeman suggested a picture of Natural Bridge as a possible home page attraction and change periodically with something appealing.
- Ms. Weberg suggested cave formation photos.
- Mr. Tom Smith suggested a banner that rotates up to five pictures.

### **Public Comment Period and Announcements**

Mr. Larry Smith provided information on next year's Environment Virginia Symposium, which will take place at VMI on March 31–April 2, 2015. Mr. Smith contact organizers and attempt to reserve a half-day block of sessions on cave and karst related topics to be determined and relevant to participants.

Mr. Fagan shared information on two current projects, Rockbridge County Source water overlay project (sinkhole ordinances) and a source water protection plan for Cleveland, VA (Russell County) which could expand into a broader hydrologic study.

### **Next Meeting**

Saturday, November 22, 2014, to be held at the same location. Natural Bridge Park and Historic Hotel, 15 Appledore Lane, Natural Bridge, VA 24578. Ms. Weberg will make the arrangements.

**The meeting was adjourned at 3:45 p.m.**

*Minutes submitted by Ms. Janet Tinkham*

## ATTACHMENT

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Abstracts referenced in the Karst Program report with primary DCR authorship:

Karst hydrology of the Cedars Significant Karst Area, Revisited: Lee County, Virginia

Wil Orndorff, Virginia Division of Natural Heritage

Bill Balfour

Ellen Koertge, Virginia Division of Natural Heritage

Shane Hanlon, US Fish and Wildlife Service

### Abstract for 2014 Convention of the National Speleological Society

The Cedars is one of seven karst areas designated as significant under the Virginia Cave Protection Act. This 19 by 4 kilometer synclinal trough defines the range of the federally endangered Lee County Cave isopod and is home to other rare cave invertebrates and rare plant communities on the surface, with over a thousand acres in the Virginia Natural Area Preserve System. However, portions of the Cedars have been degraded by groundwater contamination and land development. For these reasons, the Cedars has been the subject over the last quarter century of numerous hydrogeological investigations (Jones, 1990; Rea, 1993; Ewers, 1995) and heretofore unpublished traces (VA-DCR – Brown, Orndorff, Fagan, et al). After compiling previous traces into a single GIS coverage, target areas were identified and additional traces performed to better define internal spring basins. Considered in light of temperature and conductivity data collected over the last six years pursuant to monitoring habitat of the Lee County Cave isopod, a clearer picture of the Cedars hydrology has emerged. Once thought to be the major resurgence for the western Cedars, Sims Spring actually drains little of the Cedars, its flow derived instead from a sinking perennial surface stream to the North. Flanary Bridge Springs along the Powell River have the largest autogenically derived discharge. High flow and divergent traces suggest that subterranean stream piracy is expanding watersheds of springs along the Cedars' southern flank at the expense of Sims Spring, which in turn is capturing Dry Creek to the north.

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Updating records of invertebrate cave fauna adjacent to roadway corridors in Virginia

Ellen Koertge, Rebecca Stewart and Wil Orndorff

VA DCR Natural Heritage Program

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[Ellen.Koertge@dcr.virginia.gov](mailto:Ellen.Koertge@dcr.virginia.gov)

Abstract for 2014 Convention of the National Speleological Society

Many documented localities (element occurrences - EOs) of designated significant caves and associated rare cave adapted species in Virginia have not been visited for decades (as far back as 1939), leaving the status of populations and habitats in question. The goal of this ongoing project is to update the status of cave fauna within or adjacent to Virginia Department of Transportation rights of way. During fall 2013 eleven such caves were visited to update status of element occurrences. Each cave was visited twice within 24 hours to a week of each visit. The initial visits consisted of observation, collection, and placement of bait stations while the second visit checked the traps, collected samples, and removed bait. Voucher specimens were collected for species not previously documented in the cave. Of the 11 caves inventoried, three caves had no prior record of invertebrate fauna. 48% of the documented element occurrences were confirmed in the remaining caves. For common species in the same caves, 74% were confirmed. Furthermore, in 8 of the 11 caves, species not previously documented were found, including in the three caves with no prior records. This study reinforces the importance of visiting caves on multiple occasions for inventory in order to monitor persistence and change over time, and to get a more complete picture of the biodiversity of a specific site. As this project continues, we hope to develop a statistically valid dataset for comparison of the persistence of rare versus common taxa, and to start species accumulation curves for each cave.

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Temperature, conductivity, turbidity and level responses to precipitation of phreatic waters exposed in cave fissures: implications for deep groundwater flow in the Shenandoah Valley karst

Wil Orndorff, Virginia Department of Conservation and Recreation Natural Heritage Program, 8 Radford Street, Suite 102A, Christiansburg, VA 24073, [Wil.Orndorff@dcr.virginia.gov](mailto:Wil.Orndorff@dcr.virginia.gov)

Abstract to the 2014 Meeting of the Southeastern Region of the Geological Society of America

Analysis of time series data for water quality parameters in phreatic cave fissures suggests complex circulation patterns within karst aquifers in Cambro-ordovician aged carbonate rocks of the Shenandoah Valley. Since late summer, 2011, automatic loggers in three phreatic fissure in caves in the South Fork Shenandoah River basin, Virginia have measured water level, electrical conductivity, and temperature hourly, with turbidity added in 2012. Madison Saltpetre cave (MSC, Grottoes, VA) is developed in the Cambrian Conococheague Formation, while 100km to the north Brother Dave's Cave (BDC) and Power Plant Pit (PPP) are developed in the lower Ordovician aged Rockdale Run Formation. MSC levels rise slowly following

precipitation events, ranging approximately one meter, while conductivity, temperature, and turbidity remain constant. Unlike MSC, BDC and PPP respond strongly to precipitation, though in very different ways despite their ~100m proximity. PPP shows large increases in level ( $R=6\text{m}$ ) and turbidity with sharp decreases in conductivity; BDC shows short-lived, moderate increases in level ( $R=1\text{m}$ ), turbidity, and conductivity. Water levels at PPP and BDC do not track consistently, suggesting these water bodies are hydrologically isolated under at least some conditions. In response to precipitation, PPP temperatures increase in summer and decrease in winter, while those in BDC increase following winter events. Base flow conductivity and temperature are higher at PPP than MSC or BDC. These data suggest that MSC exposes phreatic water with little surface connection, PPP upwelling water with surface stormwater inputs, and BDC shallow phreatic water mixing with upwelling waters displaced by remote infiltration of surface waters.